

1 Attorney Docket No. 84280

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3 **A METHOD TO ESTIMATE THE MECHANICAL PROPERTIES OF A SOLID**  
4 **MATERIAL SUBJECTED TO INSONIFICATION**

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6 **ABSTRACT OF THE DISCLOSURE**

7 A method for measuring the complex frequency-dependent  
8 dilatational and shear wavespeeds of a slab of material  
9 subjected to insonification. Transfer functions that are  
10 obtained by insonifying the material at different angles. Once  
11 this is accomplished, the transfer functions are manipulated  
12 with an inverse method to yield closed form values of  
13 dilatational and shear wavespeeds at any test frequency. The  
14 wavespeeds can be combined to determine complex Lamé constants,  
15 complex Young's modulus, complex shear modulus, and complex  
16 Poisson's ratio.